

Nonfatal Injuries to Alaska Workers

Surveillance of nonfatal, work-related injuries can come from various data sources. Originally designed for internal quality control of patient care for hospital and state trauma systems, trauma registries contain many fields of information that are useful for injury surveillance. Trauma registries are unique sources of injury data: demographics, geographic information, disability, medical cost, payment source, cause of injury, discharge diagnosis, and severity scoring are only a few of the examples of data that are collected. NIOSH has developed a strong partnership with the State of Alaska Department of Health and Social Services (AKDHSS), Section of Community Health and Emergency Medical Services, Alaska Trauma Registry (ATR). This partnership includes federal program support and funding for the ATR. This section describes how the ATR is being used for nonfatal work-related injury surveillance in Alaska.

The ATR has proven to be a useful information source in monitoring nonfatal work-related injuries in Alaska and can serve as a model for other trauma registries nationwide.³⁹ The ATR is a population-based data system, gathering information on traumatic injury hospitalizations from all of Alaska's 24 acute-care hospitals. (See Figure 16.) In 1988 a pilot project began in seven Alaska hospitals for development of a trauma registry to assess quality of patient care in the local trauma systems. Success as a quality assurance tool led to the implementation of a statewide trauma registry (in all 24 hospitals in Alaska) in January 1991.⁴⁰ At that time local injury prevention organizations recognized that the ATR contained sufficient information to be used as an injury surveillance data source. Since 1991 the ATR has been used extensively as a quality assurance and injury prevention data source. NIOSH has collaborated with the development and implementation of work-related injury information collection in the ATR. Information on work-related injuries, including industry and occupation, is currently being used for injury surveillance in this area. To be included in the ATR, patients must have suffered a traumatic injury or poisoning, defined by an ICD-9-CM "N" code (discharge diagnosis) ranging from 800.00 to 995.89. Patients either have to be admitted to a hospital in Alaska, transferred to another acute care facility for a higher level of care, or declared dead in the Emergency Department. Up to 158 data elements are abstracted from medical record charts. The information is sent to AKDHSS to be compiled into the ATR database. A data subset is then created for occupational injury prevention research. The injury surveillance data for work-

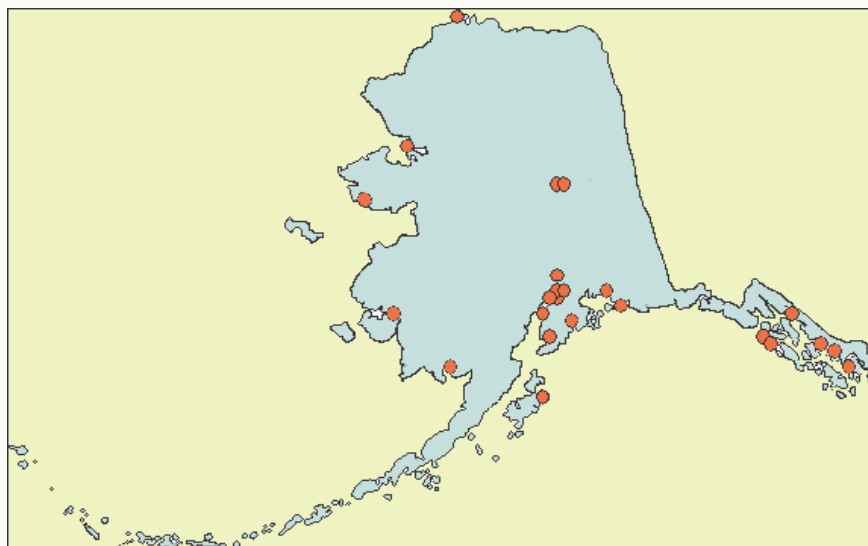
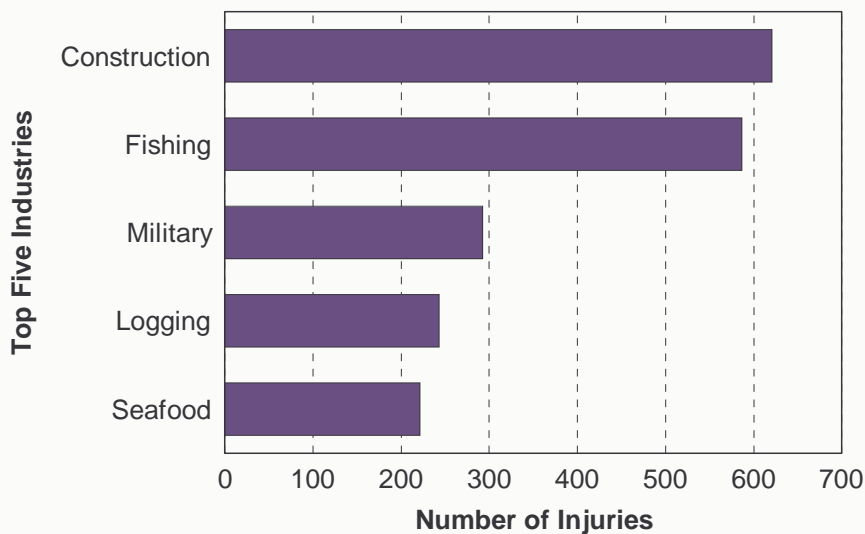


Figure 16: Acute care hospitals in Alaska

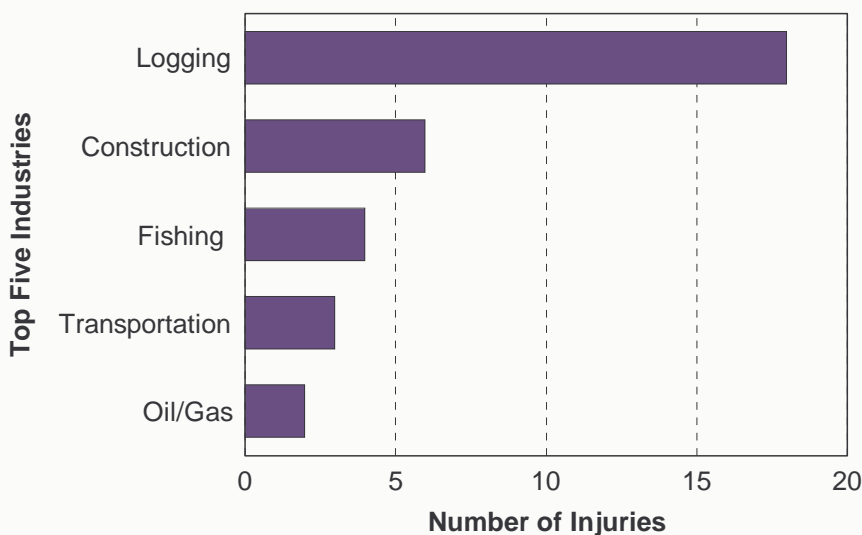
related injuries are then transferred to NIOSH and undergo further coding and analysis. Analysis of trend data and identification of hazardous processes are used in developing injury prevention strategies specifically targeted to high-risk industries and work environments.

From 1991 through 1997, the construction and commercial fishing industries had the highest number of injuries among ATR work-related cases. In analysis of injury risk by industry, using available denominator data to calculate rates, the logging industry led with the highest injury rate, (18/1,000 workers/year), followed by construction (6/1,000 workers/year). (See Figures 17 and 18.)



Source: ATR

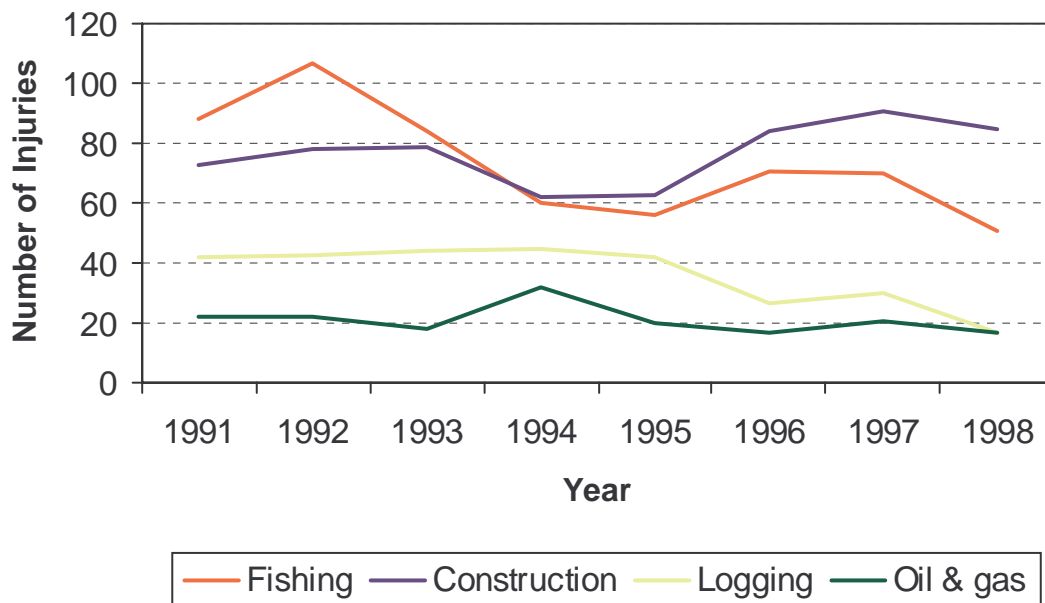
Figure 17: Number of Work-related Injuries by Industry, 1991-1998



Source: ATR

Figure 18: Work-related Injury Rates per 1000 Workers, by Industry 1991-1998

For the time period 1991 through 1993, commercial fishing had the highest number of injuries for all industries in the ATR. Since 1994, the construction industry surpassed commercial fishing as the industry with the highest number of injuries each year, and has led ever since. The annual trend for nonfatal work-related injuries by industry shows an overall decline during the time period analyzed. (See Figure 19.) However, considering the variables that can be involved in deciding if a patient will be admitted to an Alaska hospital, other factors might influence the number of work-related hospitalized cases found in the ATR, e.g., the recent trend of treating more patients with serious injuries on an outpatient basis.



Source: ATR

Figure 19: Numbers of Nonfatal Injuries by Industry and Year

Industry Analysis

Injury prevention efforts are targeted to those industries identified by ATR surveillance as having the highest number of injuries and high injury incidence rates, including construction, logging, and commercial fishing.

An analysis of work-related injury allows research into types of injuries, using the ICD-9-CM “N” codes from the ATR. The Registry includes information on body regions injured, derived from “N” codes. The registry also records ICD-9-CM “E” codes, which describe the cause of injury. NIOSH is focusing its injury prevention efforts on the leading three causes of injury, types of injury, and body regions affected, in each of the priority industries.



Photo 19: Residential construction site in southcentral Alaska

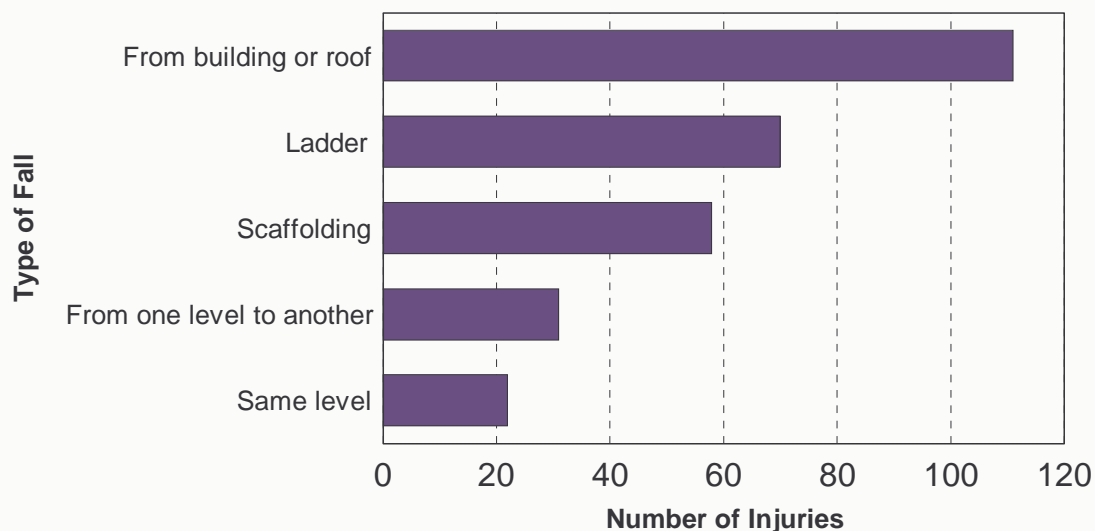
Construction Industry

Leading causes of injuries in the construction industry include falls, machinery, and being struck by an object. (See Table 11.) Falls can be categorized as: falls from buildings or roofs; falls from ladders; falls from scaffolding; falls from one level to another (usually from a distance of 8 feet or less); and falls on the same level, which include slips and trips. Local conditions can aggravate these hazards with ice and snow. (See Photos 19 and 21.) As shown in Figure 20, the majority of the falls in hospitalized construction workers in Alaska were from buildings or roofs. Fractured bones were the leading type of injury to construction workers, followed distantly by open wounds. The majority of injuries to construction workers occurred to their extremities. (See Table 11.)

Table 11: Construction Industry Injury Profile, Alaska 1991-1998,
n= 621, Source: ATR

Cause of Injury		Nature of Injury		Body Region Injured	
Fall	315	Fractured bone	355	Lower extremity	194
Machinery	105	Open wound	70	Upper extremity	175
Struck by object	72	Sprain/strain	37	Spine	71
Other	129	Other	159	Other	181

These data have helped to focus worker education programs on preventing injuries in the construction industry. Through the Alaska Injury Prevention Center, a local community safety-oriented nonprofit organization, information has been provided to local contractors to assist in their safety training. ATR data has also been used to emphasize and direct statewide construction safety training at the Alaska Governor’s Safety and Health Conference.



Source: ATR

Figure 20: Work-related Fall Injuries in the Construction Industry, 1991-1998

Logging Industry

In the Alaska logging industry, the majority of hospitalized injuries were caused by being struck by an object, followed by cutting or piercing objects, then falls. (See Table 12.) The objects most commonly striking workers were trees, logs, or limbs. The most common type of injury was a fractured bone, and the body region most commonly injured was the lower extremity, which includes workers' legs and feet.

Table 12: Construction Industry Injury Profile, Alaska 1991-1998,
n= 244, Source: ATR

Cause of Injury	Nature of Injury	Body Region Injured
Struck by object 122	Fractured bone 143	Lower extremity 93
Cutting/piercing object 43	Open wound 43	Upper extremity 52
Fall 42	Sprain/strain 21	Head 45
Other 37	Other 37	Other 54

Work is currently being done with the Alaska Department of Labor and AKDHSS to categorize and prevent the high rate of hospitalized injuries in the logging industry. Information on nonfatal injuries has been shared with logging safety personnel at the Occupational Safety and Health Administration Region X Logging Safety Summit.⁴¹The ATR data has been used by the University of Washington, Pacific Northwest Agricultural Safety and Health Center, in the *Occupational Research Agenda for Northwest Forestlands*⁴² to set priorities in health and safety research in the northwest logging industry.



Photo 20: Typical logging camp scene in southeast Alaska

Commercial Fishing

Injuries from machinery were the leading cause of nonfatal injuries in the commercial fishing industry. Falls ranked a close second. These falls most often occurred into holds, through open hatchways, and as a result of slipping on ladders and gangways. Injuries from machinery often involved equipment unique to this industry. “Crab pots” (baited cages weighing up to 800 lbs.) and “crab pot launchers” were listed as factors in a number of injuries. A crab pot launcher is a hydraulic lift which raises and tilts the pot over the top of the gunwale where it slides into the water. Fishing nets, lines, and winches were also repeatedly mentioned in the injury description. Extremities were the body region most often injured. (See Table 13.)

Table 13: Commercial Fishing Industry Injury Profile, Alaska 1991-1998,
n= 587, Source: ATR

Cause of Injury		Nature of Injury		Body Region Injured	
Machinery	187	Fractured bone	279	Upper extremity	184
Falls	149	Open wound	73	Lower extremity	171
Struck by object	98	Burn	29	Spine	35
Other	153	Other	206	Other	197

Contributing factors in commercial fishing deaths differ from the factors associated with nonfatal injuries to workers in this industry. Most commercial fishing deaths result from the loss of a vessel or from a fisherman falling overboard. Most nonfatal injuries occur while working on the vessel, either on deck or below, from machinery on deck, falls, and/or being struck by objects. The deck of a fishing boat is an unusually hazardous working environment. Not only are workers exposed to the elements, but the deck affords an unstable work platform, as it is constantly moving and is often congested with machinery. In addition it may be covered with oil, ice, water, and fish slime. In its 1991 study on fishing vessel safety, the National Research Council (NRC) noted: “The apparent high incidence of workplace accidents suggests inadequately designed safety features in machinery, deck layouts, and fishing gear.”²¹ Research on the relationships among the vessel, fishing equipment, and workers, and efforts to develop and organize safer on-deck equipment is currently underway by NIOSH.

As previously noted, trauma registries are unique sources of a variety of useful injury data. Researchers are encouraged to explore trauma registries as a data source for work-related injury surveillance and work with health departments or hospitals that collect these data so they can be aware of the utility of trauma registries for occupational injury surveillance.